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DEVELOPMENT OF DIGITAL SIMULATION OF LUNAR ENVIRONMENT FOR LUNAR HABITAT
DESIGN

Abstract

The construction of a manned lunar base is an important milestone in human exploration and space colonization. It emphasizes the need to build spaces that ensure safety and well-being, not only for exploration missions, but also for sustainable planetary habitation. However, in order for astronauts, scientists, tourists, etc. to lead a stable life in the extreme space environment, various functions and complex technologies are required. Traditional Earth construction differs from space construction in that it provides a foundation and materials that can accommodate this diversity and complexity. Transporting and building the materials needed to construct a lunar base from Earth to the Moon is very costly and time-consuming, and the manpower required on site is limited by space and scale. In addition, verification and monitoring are required throughout the construction process, from source technology to application technology, operation/management, maintenance/repair, and so on. Therefore, building a digital simulation environment has the advantage of simulating the possibility of base construction in advance by building a space similar to the actual construction status, and making predictions and verification work possible, which makes it possible to prepare various alternatives. This study explains the background and status of Korea's lunar base construction roadmap and suggests ways to build and use a digital simulation environment for lunar base construction.